

LOGSHEET FOR FIELD CHANGES TO CONTROLLED DOCUMENTS

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description of Change (s)	Resp Manager Approval	Compliance Approval	ES-400 Approval	Rad Eng Approval	Quality Assurance	Completion of ADM 2.01 Checklist	Completion of SESUSOD Checklist
15	7.16.97	RT/AMRS 86-0061	Final Sub Specifics H100 to H100 Source Requested by the Manufacturer	4.5, 4.7 and 4.10, 4.11	Changes are made to reflect the operating address of the Sub. The Manufacturer's drawings are used in the drawings.	WJ	N/A WJ	MDS	Jan	WJ	MDS	MDS
15	7.16.97	RT/AMRS 86-0061	Final Sub Specifics H100 to H100 Source Requested by the Manufacturer	4.12, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.20, 4.21, 4.22, 4.23, 4.24, 4.25, 4.26, 4.27, 4.28, 4.29, 4.30, 4.31, 4.32, 4.33, 4.34, 4.35, 4.36, 4.37, 4.38, 4.39, 4.40, 4.41, 4.42, 4.43, 4.44, 4.45, 4.46, 4.47, 4.48, 4.49, 4.50, 4.51, 4.52, 4.53, 4.54, 4.55, 4.56, 4.57, 4.58, 4.59, 4.60, 4.61, 4.62, 4.63, 4.64, 4.65, 4.66, 4.67, 4.68, 4.69, 4.70, 4.71, 4.72, 4.73, 4.74, 4.75, 4.76, 4.77, 4.78, 4.79, 4.80, 4.81, 4.82, 4.83, 4.84, 4.85, 4.86, 4.87, 4.88, 4.89, 4.90, 4.91, 4.92, 4.93, 4.94, 4.95, 4.96, 4.97, 4.98, 4.99, 5.00, 5.01, 5.02, 5.03, 5.04, 5.05, 5.06, 5.07, 5.08, 5.09, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 5.23, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 5.32, 5.33, 5.34, 5.35, 5.36, 5.37, 5.38, 5.39, 5.40, 5.41, 5.42, 5.43, 5.44, 5.45, 5.46, 5.47, 5.48, 5.49, 5.50, 5.51, 5.52, 5.53, 5.54, 5.55, 5.56, 5.57, 5.58, 5.59, 5.60, 5.61, 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21.96, 21.97, 21.98, 21.99, 22.00, 22.01, 22.02, 22.03, 22								

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Figure 3 4 Contaminated Soil Feed Stockpile Map

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Figure 8 2 Map to RFETS Medical - Building 122

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Field Change No.1

Field Change No.15

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

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prepared and resides in the Field Implementation Plan (FIP) In addition, the Site Safety Officer will escort every load of soil to ensure prompt response to any spills and to monitor for VOCs and particulates The forty ton articulated truck will be dumped in a manner which limits tire contact with contaminated soil Activities required to accomplish the transport and dumping of contaminated soil include the following

- Working under the stipulations of a Radiological Work Permit
- Operating the forty ton dump truck,
- Posting the dump truck as an SCA
- Wearing appropriate personal protective equipment,
- Closing the northernmost lane of the East Access Road,
- Positioning flagpersons on the two north-south roads to control traffic during truck movement,
- Spraying water when loading and prior to transport to minimize dust,
- Escorting the dump truck to ensure prompt response should a spill or dust generation occur,
- Performing CSFS EZ/SCA perimeter high volume radiological air monitoring,
- Performing support zone perimeter low volume radiological air monitoring,
- Performing radiological surveys on soils, and equipment,
- Frisking personnel for radiological purposes,
- Conducting real time air monitoring for VOCs and particulates,
- Conducting personal integrated air sampling for VOCs,
- Monitoring personnel for noise and heat/cold stress exposure,
- Spraying water when dumping soil to minimize dust,
- Decontaminating equipment,
- Performing personnel contamination control, and
- Managing waste such as disposable personal protective equipment

4 5 TASK 5 - MANAGEMENT OF CONTAMINATED SOIL FEED STOCKPILE

This task involves the management of the contaminated soil at the CSFS To facilitate efficient loading of the CSFS, a front end loader will be utilized Management of the CSFS also includes the pumping of incidental water from the stormwater collection system and covering the CSFS with a water-resistant tarpaulin at the end of the shift On July 7, 1997, the SCA at the CSFS was deposited based on gamma spectroscopy analyses of soil samples obtained from the CSFS The gamma-ray spectroscopy report indicated no Tier 2 radiological levels were exceeded (Appendix F) Authorization to deposit the SCA based on the Tier 2 levels is contained in the document titled "Final Technical Basis for Posting and Radiological Control Requirements in Environmental Restoration Activities", dated March 5, 1997 Upon depositing, radiological controls are not required However, based on Best Management Practices (BMP) several precautionary controls will be maintained and are summarized below and in the revised ALARA review (Appendix F) The SCA depositing and BMP derived radiological controls are also reflected in Tasks 7, 10, 11, and 12 Activities required to accomplish the loading and management of the CSFS include the following

Field Change No.15

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

Field Change No.15

- Working under the stipulations of a Radiological Work Permit, as required,
- Operating the front end loader,
- Wearing appropriate personal protective equipment,
- Performing CSFS EZ and SCA (if required) perimeter high volume radiological air monitoring, as required and as a BMP,
- Performing support zone perimeter low volume radiological air monitoring, as required and as a BMP,
- Performing radiological surveys on soils, and equipment, as required and as a BMP,
- Frisking personnel for radiological purposes, as required,
- Conducting real-time air monitoring for VOCs and particulates,
- Conducting personal integrated air sampling for VOCs,
- Monitoring personnel for noise and heat/cold stress exposure,
- Spraying water when dumping and moving soil to minimize dust,
- Covering the CSFS with a water-resistant tarpaulin,
- Pumping incidental water from the stormwater collection system,
- Decontaminating equipment,
- Performing personnel contamination control,
- Managing waste such as disposable personal protective equipment, and
- Securing the CSFS at the end of each day

4 6 TASK 6 - EXCAVATION VERIFICATION SAMPLING

Excavation verification samples will be used to establish the post-action condition of the soils at the boundaries of the excavation. Samples will be collected and analyzed for the VOC contaminants of concern as described in the Sampling and Analysis Plan. Since the existing characterization data indicates that metals and semi-volatile contaminants are below cleanup levels in the trenches, no further soil sampling will be done for those constituents. Activities required to accomplish this sampling include the following:

- Working under the stipulations of a Radiological Work Permit
- Operating the excavator,
- Wearing appropriate personal protective equipment,
- Performing excavation EZ/SCA perimeter high volume radiological air monitoring,
- Performing support zone perimeter low volume radiological air monitoring,
- Performing radiological surveys on soils, and equipment,
- Frisking personnel for radiological purposes,
- Conducting real-time air monitoring for VOCs, and particulates,
- Conducting personal integrated air sampling for VOCs,
- Monitoring personnel for noise and heat/cold stress exposure,
- Decontaminating the excavator bucket,
- Sampling from the excavator bucket,

- Decontaminating sampling equipment,
- Performing personnel contamination control,
- Managing waste such as disposable personal protective equipment and sampling equipment, and
- Packaging the samples for shipment,

4.7 TASK 7 - DECONTAMINATION OF EQUIPMENT

All materials and equipment in contact with soils will require decontamination prior to release from the EZ/SCA at either the excavation or CSFS and prior to free release from RFETS to off site locations. Decontamination methods will vary depending on the location and extent of contamination and effectiveness will be determined by visual inspection, radiological surveys and volatile organic compound monitoring. At the discretion of the Project Manager, items may be decontaminated in the field or transferred to the Main Decontamination Facility. Activities required to decontaminate heavy equipment and materials include the following:

- Working under the stipulations of a Radiological Work Permit, as required,
- Staging heavy equipment,
- Wearing appropriate personal protective equipment,
- Performing excavation or CSFS perimeter high volume radiological air monitoring as required and as a BMP,
- Performing excavation or CSFS perimeter low volume radiological air monitoring as required and as a BMP,
- Performing radiological surveys on equipment as required and as a BMP,
- Frisking personnel for radiological purposes, as required,
- Conducting real-time air monitoring for VOCs and particulates,
- Conducting personal integrated air sampling for VOCs if necessary,
- Monitoring personnel for noise and heat stress exposure,
- Establishing a portable decontamination station with secondary containment,
- Transferring items to the Main Decontamination Facility,
- Spraying water at low or high pressures,
- Wiping or scrubbing,
- Performing personnel contamination control, and
- Managing waste such as disposable personal protective equipment and decontamination fluids

4.8 TASK 8 - SOIL TREATMENT

Soil will be treated using a low vacuum low temperature thermal desorption system (TDU) operated by a treatment subcontractor. The TDU will be assembled and operated in the TDU area as shown in Figure 3.2. The TDU is a batch treatment system that is capable of desorbing contaminants under a non-oxidative atmosphere and low temperature such that the desorbed contaminants do not degrade and generate thermal or oxidative by-products. The CSFS is located proximal to the TDU site allowing short staging time prior

to treatment in the TDUs. Operation of the TDU system will be addressed in an additional Health and Safety Plan which will be prepared by the treatment subcontractor and approved by the RMRS Project Manager, RMRS Radiological Coordinator, RMRS Health and Safety Supervisor, RMRS Radiological Safety Section Manager, and SSOC Radiological Engineering.

4.9 TASK 9 - POST TREATMENT VERIFICATION SAMPLING

Post treatment verification samples will be taken by the treatment subcontractor to verify compliance with treatment standards. Samples will be collected and analyzed for the VOC contaminants of concern as described in the SAP. Since the existing characterization data indicates that metals and semi-volatile contaminants are below cleanup levels, no further soil sampling will be done for those constituents. Post treatment verification sampling will also be addressed in the Health and Safety Plan prepared by the treatment subcontractor.

4.10 TASK 10 - TRANSPORT AND BACKFILL OF TREATED SOIL

This task involves the loading of conventional dump trucks with front end loaders to transport soil from the treated soil stockpile to the excavation. To ensure safe movement of the trucks, a Traffic Management Plan has been prepared and resides in the FIP. In addition, the Site Safety Officer will escort every load of soil to ensure prompt response to any spills. Activities required to accomplish the transport of treated soil include the following:

- Working under the stipulations of a Radiological Work Permit, as required,
- Operating the front end loader and dump trucks,
- Posting the dump trucks as SCAs, as required,
- Wearing appropriate personal protective equipment,
- Performing excavation or treated soil stockpile perimeter high volume radiological air monitoring, as required and as a BMP,
- Performing excavation or treated soil stockpile perimeter low volume radiological air monitoring, as required and as a BMP,
- Performing radiological surveys on equipment, as required and as a BMP,
- Frisking personnel for radiological purposes, as required,
- Conducting real-time air monitoring for VOCs and particulates,
- Monitoring personnel for noise and heat stress exposure,
- Spraying water when loading and prior to transport to minimize dust,
- Escorting the dump truck to ensure prompt response should a spill or dust generation occur,
- Closing the northernmost lane of the East Access Road,
- Positioning flagpersons on the north-south road to control traffic during truck movement,
- Spraying water when dumping and moving soil to minimize dust, and
- Performing personnel contamination control

Field Change No.15

4.11 TASK 11 - DECONTAMINATION OF EQUIPMENT

This task will be identical to the previous decontamination task except that no VOC contaminated soil will be present and respiratory protection must comply with the RWP, if required, for any radiological concerns that may be present when decontaminating

4.12 TASK 12 - SITE RECLAMATION

Once treated soils are returned to the excavation site, topsoil will be returned to both the excavation and CSFS areas. The topsoil will be graded and the areas will be revegetated with an appropriate seed mixture in order to return them to improved natural condition. The seed mixture will be covered to prevent wind dispersal and promote germination. Fencing, fence posts, and other material or equipment will then be removed.

Field Change No.15

- Working under the stipulations of a Radiological Work Permit, as required,
- Operating heavy equipment,
- Wearing appropriate personal protective equipment,
- Performing excavation and CSFS work area high volume radiological air monitoring, as required and as a BMP,
- Performing excavation and CSFS perimeter low volume radiological air monitoring, as required and as a BMP,
- Performing radiological surveys on materials, and equipment, as required and as a BMP,
- Frisking personnel for radiological purposes, as required,
- Monitoring personnel for noise and heat/cold stress exposure,
- Monitoring wind speed,
- Spraying water to minimize dust,
- Decontaminating equipment,
- Performing personnel contamination control,
- Managing waste such as disposable personal protective equipment,
- Performing field instrument for the detection of low energy radiation (FIDLER) surveys of treatment and excavation areas, and
- Securing the excavation and CSFS at the end of each day

Table 7.1
Task Specific
Personal Protective Equipment Summary

Task	Level	Body	Foot	Head	Eye	Hand	Respirator
Site Preparation	D	Work clothes	Steel toed safety shoes	Hard hat	Safety glasses with side shields	Heavy duty leather gloves	None required FF,APR when mixing ConCover®
Installing Stormwater Ditch and Grading Topsoil at the CSFS	Modified D	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	Safety glasses with side shields	Inner surgeon and outer nitrile gloves or inner gloves and heavy duty leather work gloves (cotton liners optional)	None required
Excavation of Contaminated Soil and CSFS Hot Spot	B	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	None	Inner surgeon and outer nitrile gloves (cotton liners optional)	Supplied air or SCBA
Transport of Contaminated Soil	B	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	None	Inner surgeon and outer nitrile gloves (cotton liners optional)	Supplied air or SCBA
Management of CSFS	B	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	None	Inner surgeon and outer nitrile gloves (cotton liners optional)	Supplied air or SCBA
Excavation/CSFS Verification Sampling	B	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	None	Inner surgeon and outer nitrile gloves (cotton liners optional)	Supplied air or SCBA
Decontamination of Equipment ⁵	B ³	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	None ⁴	Inner surgeon and outer nitrile gloves (cotton liners optional)	Supplied air or SCBA
Transport and Backfill of Treated Soil	Modified D ³	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	Safety glasses with side shields	Inner surgeon and outer nitrile gloves (cotton liners optional)	None required
Decontamination of Equipment ⁵	Modified D ³	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	Safety glasses with side shields	Inner surgeon and outer nitrile gloves (cotton liners optional)	None required
Site Reclamation	Modified D ³	Anti-C Tyvek®	Steel toe safety shoes and shoe covers	Hard hat	Safety glasses with face shield	Inner surgeon and outer nitrile gloves or inner gloves and heavy duty leather work gloves (cotton liners optional)	None required

¹ If splash hazards exists and cannot be mitigated, polycoated Tyvek® will be worn Anti-C Tyvek® required in radiological controlled areas only

² No eye protection will be required when a full facepiece respirator is worn

³ Work may be conducted without respiratory protection if continuous real time air monitoring indicates no volatile organic compounds at levels above background and the RWP does not require respirators for radiological purposes

⁴ If no respiratory protection is required, safety glasses with side shields will be worn

⁵ If high pressure water is used, 16" high, steel toed rubber boots will be worn If no respiratory protection is required and high pressure water is used, a hard hat mounted face shield will be worn in addition to the safety glasses

Field Change No.4

Field Change No.11

Field Change No.15

**MOUND SITE SOURCE REMOVAL
MANAGEMENT OF CONTAMINATED SOIL FEED STOCKPILE**

Activity Hazard Analysis

1-28-97

Activity	Hazard	Preventative Measures
All site activities	General work hazards	All personnel will wear steel toed shoes, safety glasses with side shields, hard hats, reflective vests, and hearing protection as applicable in the support zone
	Heat stress	Heat stress monitoring will be conducted in regards to work load and PPE worn
	Cold stress	Cold stress monitoring will be conducted Proper clothing will be available to all personnel and administrative controls will be adhered to
	Noise	Noise monitoring will be conducted Where necessary personnel will wear hearing protection In addition, all personnel will participate in the RFETS Hearing Conservation Program if necessary
Traversing the site	Slip, trips, falls	Care will be taken when traversing the site especially when wearing PPE and carrying equipment - All trip hazards will be immediately removed or marked when identified
Lifting equipment and materials	Back injury	Proper lifting techniques will be used and heavy equipment, where feasible, will be utilized to move heavy loads
Handling equipment and materials	Pinch points and sharp edges	Care will be taken when pinch points and sharp edges exist and heavy duty leather work gloves will be worn

Activity	Hazard	Preventative Measures
Using hand tools	Hand tools in unsafe operating condition	Hand tools will be inspected by the user prior to each use
	Improper use of hand tools	Hand tools will be utilized for their intended use and operated in accordance with HSP-12 10 Guards will be in place and no modifications will be made
	Electrical shock	Portable power tools will be plugged into a GFCI protected outlet and will be UL listed and double insulated Cords will be inspected by the user and protected from unnecessary damage Any tool whose cord shows signs of damage or deterioration will be immediately removed from service
Use of generators	Electrical shock	Extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage Any extension cords which show signs of damage or deterioration will be immediately removed from service
	Electrical shock	Cords will be plugged into a GFCI protected outlet and the generator will be properly grounded The GFCI will be tested by the user daily prior to the beginning of each shift
	Fire	At a minimum, a 10 lb ABC fire extinguisher will be located in the work area and next to the generator All refueling will be conducted at the beginning of the shift when the generators are cool
	Use of gasoline	Follow recommendations on MSDS (see Appendix C)

Activity	Hazard	Preventative Measures
Front end loader operation	Front end loader in poor operating condition	The front end loader will be inspected prior to entering the site The operator will inspect and document the front end loader prior to the beginning of each shift
	Improper operation of the front end loader	Operators will be properly trained in the use and limitations of the front end loader
	Ground personnel being struck with front end loader or falling loads	Personnel will wear orange vests, stay at least 20' away from the front end loader, and maintain line of sight with the operator
	Other equipment being struck with front end loader	Front end loader operations will be conducted in a deliberate safe manner A spotter will be required when backing the front end loader
Use of Level B respiratory protection	Physical fatigue	Medical approval will be required for personnel
	Improper face to facepiece seal	Respirator specific fit test approval will be required for personnel
	Improper inspection or use of respirator	Personnel will be trained in the inspection, use, and limitations of the specific respirator worn
	Unsecured airline bottles on front end loader	Airline bottles will be inspected by the user prior to and during each shift
Moving contaminated soil	Skin exposure to volatile organic compounds	Personnel in the EZ will wear Level B PPE and limit contact with contaminated soil
	Inhalation of volatile organic compounds	Personnel in the EZ will wear Level B respiratory protection CRZ and support zone work controls will be based on perimeter real-time VOC monitoring

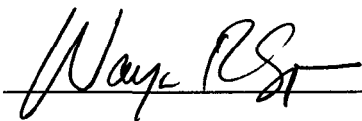
Activity	Hazard	Preventative Measures
Spraying water for dust control and pumping decontamination or incidental water into the holding tanks or into tanker trucks	Pump malfunction or hose rupture	Pumps and hoses will be inspected by the user prior to use The hose will be protected from unnecessary damage The discharge end of the incidental water hose will be submerged in the holding tank Tankers will be filled in accordance with their safety guidelines
Covering stockpile with tarpaulin	Slips, trips, falls, and back injury	Use front end loader to pull tarp if feasible Use a many people as possible to move tarp Do not attempt to cover stockpile alone

Approved.


Signature

Date


RMRS Project Manager-Wayne Sproles

 7-17-97

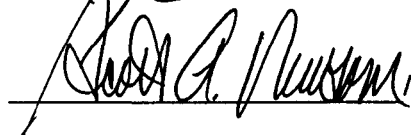
RMRS H&S Supervisor-Peggy Schreckengast

 7-16-97

RMRS Radiological Coordinator-Jerry Anderson

 7/16/97

SSOC Radiological Engineer-Scott Newsom

 7/16/97

**MOUND SITE SOURCE REMOVAL
POST EXCAVATION AND TRANSPORT
DECONTAMINATION OF EQUIPMENT**

Activity Hazard Analysis

1-28-97

Activity	Hazard	Preventative Measures
All site activities	General work hazards	All personnel will wear steel toed shoes, safety glasses with side shields, hard hats, reflective vests and hearing protection as applicable in the support zone
	Heat stress	Heat stress monitoring will be conducted in regards to work load and PPE worn
	Cold stress	Cold stress monitoring will be conducted Proper clothing will be available to all personnel and administrative controls will be adhered to
	Noise	Noise monitoring will be conducted Where necessary personnel will wear hearing protection In addition, all personnel will participate in the RFETS Hearing Conservation Program if necessary
Traversing the site	Slip, trips, falls	Care will be taken when traversing the site especially when wearing PPE and carrying equipment All trip hazards will be immediately removed or marked when identified
Lifting equipment and materials	Back injury	Proper lifting techniques will be used and heavy equipment, where feasible, will be utilized to move heavy loads

Activity	Hazard	Preventative Measures
Handling equipment and materials	Pinch points and sharp edges	Care will be taken when pinch points and sharp edges exist and heavy duty leather work gloves will be worn
Using hand tools	Hand tools in unsafe operating condition	Hand tools will be inspected by the user prior to each use
	Improper use of hand tools	Hand tools will be utilized for their intended use and operated in accordance with HSP-12 10 Guards will be in place and no modifications will be made
	Electrical shock	Portable power tools will be plugged into a GFCI protected outlet and will be UL listed and double insulated Cords will be inspected and protected from unnecessary damage Any tool whose cord shows signs of damage or deterioration will be immediately removed from service
Use of generators	Electrical shock	Extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage Any extension cords which show signs of damage or deterioration will be immediately removed from service
	Electrical shock	Cords will be plugged into a GFCI protected outlet and the generator will be properly grounded The GFCI will be tested by the user daily prior to the beginning of each shift
	Fire	At a minimum, a 10 lb ABC fire extinguisher will be located in the work area and next to the generator All refueling will be conducted at the beginning of the shift when the generators are cool
	Use of gasoline	Follow recommendations on MSDS (see Appendix C)

Activity	Hazard	Preventative Measures
Heavy equipment operation	Heavy equipment in poor operating condition	Heavy equipment will be inspected prior to entering RFETS. The operator will inspect and document all heavy equipment prior to the beginning of each shift.
	Improper operation of heavy equipment	Operators will be properly trained in the use and limitations of all heavy equipment.
	Ground personnel being struck with heavy equipment or falling loads	Ground personnel will wear orange vests, stay at least 20' away from heavy equipment, and maintain line of sight with the operators.
	Other equipment being struck with heavy equipment	Heavy equipment operations will be conducted in a deliberate safe manner. A spotter will be required when backing heavy equipment.
Use of Level B respiratory protection	Physical fatigue	Medical approval will be required for personnel.
	Improper face to facepiece seal	Respirator specific fit test approval will be required for personnel.
	Improper inspection or use of respirator	Personnel will be trained in the inspection procedures, use, and limitations of the specific respirator worn.
	Unsecured airline bottles on heavy equipment	Airline bottles will be inspected by the user prior to and during each shift.
Decontamination and surveying of equipment	Skin exposure to volatile organic compounds	Personnel in the EZ will wear Level B PPE if required and limit contact with contaminated soil.
	Inhalation of volatile organic compounds	Personnel in the EZ will wear Level B respiratory protection if required. CRZ and support zone work controls will be based on perimeter real-time VOC monitoring.
	Skin contact with decontamination fluids	Polycoated Tyvek® will be worn if a splash hazard exists.

Activity	Hazard	Preventative Measures
Decontamination and surveying of equipment (cont)	Work with high temperature, high pressure decontamination systems	High temperature, high pressure decontamination will be conducted only by personnel with current Pressure Safety II training The decontamination system will be inspected prior to use At no time will the wand be pointed at any personnel Polycoated Tyvek®, sixteen inch high steel toed rubber boots, safety glasses with face shield, inner and outer nitrile gloves, and hard hat will be worn
Decontamination and surveying of heavy equipment	Ground personnel being struck with heavy equipment	Prior to personnel approaching heavy equipment, the operator will lower all hydraulically controlled implements, set the parking brake, turn the engine off, and give a hand signal indicating that personnel may approach
	Work on elevated surfaces	Work on unprotected elevated surfaces > 6' will be conducted in a full body harness with a lanyard attached to an approved anchorage point In addition all personnel will have current Fall Protection qualification
Pumping decontamination water	Pump malfunction or hose rupture	Pumps and hoses will be inspected by the user prior to use The hoses will be protected from unnecessary damage The discharge end of the hose will be submerged in the holding tank

Approved:

Signature

Date

RMRS Project Manager-Wayne Sproles

Wayne Sproles, 7-17-97

RMRS H&S Supervisor-Peggy Schreckengast

Peggy Schreckengast, 7-16-97

RMRS Radiological Coordinator-Jerry Anderson

[Signature], 7/16/97

SSOC Radiological Engineer-Scott Newsom

[Signature], 07/16/97

**MOUND SITE SOURCE REMOVAL
TRANSPORT AND BACKFILL OF TREATED SOIL**

Activity Hazard Analysis

1-28-97

Activity	Hazard	Preventative Measures
All site activities	General work hazards	All personnel will wear steel toed shoes, safety glasses with side shields, hard hats, reflective vests and hearing protection as applicable in the support zone
	Heat stress	Heat stress monitoring will be conducted in regards to work load and PPE worn
	Cold stress	Cold stress monitoring will be conducted Proper clothing will be available to all personnel and administrative controls will be adhered to
	Noise	Noise monitoring will be conducted Where necessary personnel will wear hearing protection In addition, all personnel will participate in the RFETS Hearing Conservation Program if necessary
Traversing the site	Slip, trips, falls	Care will be taken when traversing the site especially when wearing PPE and carrying equipment All trip hazards will be immediately removed or marked when identified
Lifting equipment and materials	Back injury	Proper lifting techniques will be used and heavy equipment, where feasible, will be utilized to move heavy loads
Handling equipment and materials	Pinch points and sharp edges	Care will be taken when pinch points and sharp edges exist and heavy duty leather work gloves will be worn

Activity	Hazard	Preventative Measures
Using hand tools	Hand tools in unsafe operating condition	Hand tools will be inspected by the user prior to each use
	Improper use of hand tools	Hand tools will be utilized for their intended use and operated in accordance with HSP-12 10 Guards will be in place and no modifications will be made
	Electrical shock	Portable power tools will be plugged into a GFCI protected outlet and will be UL listed and double insulated Cords will be inspected by the user and protected from unnecessary damage Any tool whose cord shows signs of damage or deterioration will be immediately removed from service
Use of generators	Electrical shock	Extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage Any extension cords which show signs of damage or deterioration will be immediately removed from service
	Electrical shock	Cords will be plugged into a GFCI protected outlet and the generator will be properly grounded The GFCI will be tested by the user daily prior to the beginning of each shift
	Fire	At a minimum, a 10 lb ABC fire extinguisher will be located in the work area and next to the generator All refueling will be conducted at the beginning of the shift when the generators are cool
	Use of gasoline	Follow recommendations on MSDS (see Appendix C)

Activity	Hazard	Preventative Measures
Front end loader and dump truck operations at the excavation and CSFS	Front end loader or dump trucks in poor operating condition	The dump trucks will be inspected prior to entering RFETS The operators will inspect and document the front end loader and dump trucks prior to the beginning of each shift
	Improper operation of the front end loader or dump trucks	Operators will be properly trained in the use and limitations of the front end loaders and dump trucks
	Ground personnel being struck with front end loader, dump trucks, or falling loads	Ground personnel will wear orange vests, stay at least 20' away from the front end loader and dump trucks, and maintain line of sight with the operators
	Vehicular traffic being struck with dump trucks	Prior to movement of the dump trucks, the flagpersons will confirm that they are in position, all traffic is stopped, and the path of travel is clear
	Other equipment being struck with front end loader or dump trucks	The dump trucks will be stationary with the parking brake set prior to loading of soil All front end loader and dump truck operations will be conducted in a deliberate safe manner A spotter will be required when backing the front end loader and dump trucks
	Spills or dust generation during transport	A one foot freeboard will be maintained at all times Water will be sprayed on the load prior to transport and speed will be limited to 5 mph Direct observation will ensure prompt response should a spill or dust generation occur
Dumping treated soil at the excavation	Ground personnel being engulfed by dumped soil	Ground personnel will stay at least 30' from the dump truck and the operator will not dump the load until given a visual hand signal from the spotter

Field Change No.2

Field Change No.1

Activity	Hazard	Preventative Measures
Dumping treated soil at the excavation (cont)	Dump truck falling into trench	A spotter will use hand signals to ensure that dump trucks stay a minimum of six feet away from the edge of the trench when dumping
Working around open trench	Slips, trips, falls into trench	Personnel will stay a minimum of six feet away from the edge of the trench Personnel closer than six feet must wear a full body harness and lifeline attached to an approved anchorage point
	Sloughing of trench walls	The trench will be inspected prior to and during each shift
	Equipment falling into trench	All equipment will be kept a minimum of six feet away from the edge of the trench
Spraying water for dust control	Pump malfunction or hose rupture	Pumps and hoses will be inspected by the user prior to use The hoses will be protected from unnecessary damage

Approved:

Signature

Date

RMRS Project Manager-Wayne Sproles

Wayne Sproles, 7-17-97

RMRS H&S Supervisor-Peggy Schreckengast

Peggy Schreckengast, 7-16-97

RMRS Radiological Coordinator-Jerry Anderson

Jerry Anderson, 7/16/97

SSOC Radiological Engineer-Scott Newsom

Scott Newsom, 07/16/97

**MOUND SITE SOURCE REMOVAL
POST TRANSPORT AND BACKFILL
DECONTAMINATION OF EQUIPMENT**

Activity Hazard Analysis

1-28-97

Activity	Hazard	Preventative Measures
All site activities	General work hazards	All personnel will wear steel toed shoes, safety glasses with side shields, hard hats, reflective vests, and hearing protection as applicable in the support zone
	Heat stress	Heat stress monitoring will be conducted in regards to work load and PPE worn
	Cold stress	Cold stress monitoring will be conducted Proper clothing will be available to all personnel and administrative controls will be adhered to
	Noise	Noise monitoring will be conducted Where necessary personnel will wear hearing protection In addition, all personnel will participate in the RFETS Hearing Conservation Program if necessary
Traversing the site	Slip, trips, falls	Care will be taken when traversing the site especially when wearing PPE and carrying equipment All trip hazards will be immediately removed or marked when identified
Lifting equipment and materials	Back injury	Proper lifting techniques will be used and heavy equipment, where feasible, will be utilized to move heavy loads
Handling equipment and materials	Pinch points and sharp edges	Care will be taken when pinch points and sharp edges exist and heavy duty leather work gloves will be worn

Activity	Hazard	Preventative Measures
Using hand tools	Hand tools in unsafe operating condition	Hand tools will be inspected by the user prior to each use
	Improper use of hand tools	Hand tools will be utilized for their intended use and operated in accordance with HSP-12 10 Guards will be in place and no modifications will be made
	Electrical shock	Portable power tools will be plugged into a GFCI protected outlet and will be UL listed and double insulated Cords will be inspected by the user and protected from unnecessary damage Any tool whose cord shows signs of damage or deterioration will be immediately removed from service
Use of generators	Electrical shock	Extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage Any extension cords which show signs of damage or deterioration will be immediately removed from service
	Electrical shock	Cords will be plugged into a GFCI protected outlet and the generator will be properly grounded The GFCI will be tested by the user daily prior to the beginning of each shift
	Fire	At a minimum, a 10 lb ABC fire extinguisher will be located in the work area and next to the generator All refueling will be conducted at the beginning of the shift when the generators are cool
	Use of gasoline	Follow recommendations on MSDS (see Appendix C)

Activity	Hazard	Preventative Measures
Heavy equipment operation	Heavy equipment in poor operating condition	Heavy equipment will be inspected prior to entering RFETS. Operators will inspect and document all heavy equipment prior to the beginning of each shift.
	Improper operation of heavy equipment	Operators will be properly trained in the use and limitations of all heavy equipment.
	Ground personnel being struck with heavy equipment or falling loads	Ground personnel will wear orange vests, stay at least 20' away from heavy equipment, and maintain line of sight with the operators.
	Other equipment being struck with heavy equipment	Heavy equipment operations will be conducted in a deliberate safe manner. A spotter will be required when backing heavy equipment.
Decontamination of equipment	Skin contact with decontamination fluids	Polycoated Tyvek® will be worn if a splash hazard exists.
	Work with high temperature, high pressure decontamination systems	High temperature, high pressure decontamination will be conducted only by personnel with current Pressure Safety II training. The decontamination system will be inspected prior to use. At no time will the wand be pointed at any personnel. Polycoated Tyvek®, sixteen inch high steel toed rubber boots, safety glasses with face shield, inner and outer nitrile gloves, and hard hat will be worn.
Decontamination and surveying of heavy equipment	Ground personnel being struck with heavy equipment	Prior to personnel approaching heavy equipment, the operator will lower all hydraulically controlled implements, set the parking brake, turn the engine off, and give a hand signal indicating that personnel may approach.

Activity	Hazard	Preventative Measures
Decontamination and surveying of heavy equipment	Work on elevated surfaces	All work on unprotected elevated surfaces > 6' will be conducted in a full body harness with a lanyard attached to an approved anchorage point In addition all personnel will have current Fall Protection qualification
	Pump malfunction or hose rupture	Pumps and hoses will be inspected by the user prior to use The hoses will be protected from unnecessary damage The discharge end of the hose will be submerged in the holding tank

Approved

Signature

Date

RMRS Project Manager-Wayne Sproles

Wayne Sproles 7-17-97

RMRS H&S Supervisor-Peggy Schreckengast

Peggy Schreckengast 7-16-97

RMRS Radiological Coordinator-Jerry Anderson

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SSOC Radiological Engineer-Scott Newsom

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MOUND SITE SOURCE REMOVAL

SITE RECLAMATION

Activity Hazard Analysis

1-28-97

Activity	Hazard	Preventative Measures
All site activities	General work hazards	All personnel will wear steel toed shoes, safety glasses with side shields, hard hats, reflective vests, and hearing protection as applicable in the support zone
	Heat stress	Heat stress monitoring will be conducted in regards to work load and PPE worn
	Cold stress	Cold stress monitoring will be conducted Proper clothing will be available to all personnel and administrative controls will be adhered to
	Noise	Noise monitoring will be conducted Where necessary personnel will wear hearing protection In addition, all personnel will participate in the RFETS Hearing Conservation Program if necessary
Traversing the site	Slip, trips, falls	Care will be taken when traversing the site especially when carrying equipment All trip hazards will be immediately removed or marked when identified
Lifting equipment and materials	Back injury	Proper lifting techniques will be used and heavy equipment, where feasible, will be utilized to move heavy loads
Handling equipment and materials	Pinch points and sharp edges	Care will be taken when pinch points and sharp edges exist and heavy duty leather work gloves will be worn

Activity	Hazard	Preventative Measures
Using hand tools to dismantle secondary containments	Hand tools in unsafe operating condition	Hand tools will be inspected by the user prior to each use
	Improper use of hand tools	Hand tools will be utilized for their intended use and operated in accordance with HSP-12 10 Guards will be in place and no modifications will be made
	Electrical shock	Portable power tools will be plugged into a GFCI protected outlet and will be UL listed and double insulated Cords will be inspected by the user and protected from unnecessary damage Any tool whose cord shows signs of damage or deterioration will be immediately removed from service
Use of generators	Electrical shock	Extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage Any extension cords which show signs of damage or deterioration will be immediately removed from service
	Electrical shock	Cords will be plugged into a GFCI protected outlet and the generator will be properly grounded The GFCI will be tested by the user daily prior to the beginning of each shift
	Fire	At a minimum, a 10 lb ABC fire extinguisher will be located in the work area and next to the generator All refueling will be conducted at the beginning of the shift when the generators are cool
	Use of gasoline	Follow recommendations on MSDS (see Appendix C)

Activity	Hazard	Preventative Measures
Using fork truck to move poly tanks, pumps, generators, and jersey barriers	Fork truck in poor operating condition	The operator will inspect and document the fork truck prior to the beginning of each shift
	Improper operation of fork truck	Operators will hold a current Fork Truck Operator Permit and all operations will be in accordance with HSP-9 06
	Ground personnel being struck with fork truck	Ground personnel will wear orange vests and maintain line of sight with the fork truck operator
	Other equipment being struck with fork truck	Fork truck operations will be conducted in a deliberate safe manner A spotter will be required when backing the fork truck
	Injury resulting from unsecured loads	Loads will be secured Jersey barriers will be moved with the forks in the lowest possible position and personnel will stay back a minimum of ten feet
Removing fence posts, ground rods, or equipment hold downs	Pinch points	Pay particular attention to pinch points when using pneumatic/hydraulic or slide type devices
	Ear injury	Hearing protection will be worn
Heavy equipment operation to replace topsoil and grade excavation and CSFS areas	Heavy equipment in poor operating condition	Heavy equipment will be inspected prior to entering RFETS The operators will inspect and document all heavy equipment prior to the beginning of each shift
	Improper operation of heavy equipment	Operators will be properly trained in the use and limitations of all heavy equipment
	Ground personnel being struck with heavy equipment or falling loads	Personnel will wear orange vests, stay at least 20' away from heavy equipment, and maintain line of sight with the operators

Activity	Hazard	Preventative Measures
Heavy equipment operation to replace topsoil and grade excavation and CSFS areas (cont.)	Other equipment being struck with heavy equipment	Heavy equipment operations will be conducted in a deliberate safe manner. A spotter will be required when backing heavy equipment.

Approved

Signature

Date

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APPENDIX F

GAMMA SPECTROSCOPY REPORT AND REVISED ALARA REVIEW



MEMORANDUM

DATE July 3, 1997
TO J. L. Anderson, ER Compliance Group, Bldg T893B, X6438
FROM R. C. Gentry, Re-Engineering and Operational Support, Bldg 881, X8349
SUBJECT GAMMA-RAY SPECTROSCOPY REPORT - RCG-0002-97

This correspondence is to provide a detailed report about Gamma-Ray Spectroscopy measurements that were performed on June 9, 10, 11, and 12, 1997. These measurements were made to assess the radiological constituents in soil samples taken from the Mound Area.

These measurements were made in accordance with RE Procedure - 4-W03-REP-1401, Operation of the Gamma Spectroscopy Systems. This procedure sets out the protocol to be utilized when performing measurements in various geometries and system configurations. The detector efficiency, conversion factor files, and detector active area utilized to convert peak areas to a quantified activity was predetermined by performing detector characterization. This process defines each particular detector's response as a function of angle and gamma-ray energy, such as a fingerprint or its unique response characteristics. This process is in accordance with 4-R29-REP-1402, Routine Characterization of a High Purity Germanium Detector. However, for these measurements, the quantifications listed are to be considered estimates. The specific geometry configuration utilized has not been calibrated for this system. A similar soil standard efficiency curve was utilized for analysis. The quantification listed in the report must be manually background subtracted.

The system utilized to perform these analyses was an EG&G Ortec 86% relative efficient n-type High Purity Germanium (HPGe) detector, with a beryllium window, coupled to an EG&G Ortec Nomad Plus™ multichannel analyzer (MCA). The Nomad Plus™ contains the high voltage supply, amplifier, analog to digital converter (ADC), the MCA, and associated electronic hardware. The microprocessor used to control the system was a Compaq 386s/20™. The software used was EG&G Ortec Maestro II™, Version 1.4 for the acquisition and the Environmental Gamma-Ray Analysis Software (EGAS), Version Alpha 12/20/95 for the data reduction and analysis. The parameter utilized to process the data was a glass jar side view at a fixed distance from the detector face.

The measurements were made in the following manner. The detector was positioned horizontally toward the sample. The detector face was 1 centimeter (cm) from the sample. Acquisition time was set for 3600 seconds. In addition, a 3600 second background measurement was performed for the purposes to subtract any contribution from the natural background radiation.

Results

The spectra resulted in the following. Photopeaks that are associated with the radioactive decay of naturally occurring radionuclides were detected in expected quantities. Those photopeaks are from the decay of Uranium-238 (^{238}U), Uranium-235 (^{235}U), Thorium-232 (^{232}Th), and associated daughter products. Some of the peaks observed were the 63.2 kilo-electron Volts (keV) and the 93.2 keV photopeaks from the decay of Thorium-234 (^{234}Th), the first progeny from the decay of ^{238}U . In addition, the 1001.0 keV photopeak from the decay of Protactinium-234 (^{234}Pa), the second progeny from the decay of ^{238}U . The 185.7 keV peak is utilized for ^{235}U measurement. This photopeak is a multiplet from the decay from Radium-226 (^{226}Ra) at 186.2 keV, however the analysis software routinely de-convolutes this photopeak. In addition, no photopeaks from the decay of Americium-241 (^{241}Am) was detected. ^{241}Am decay is the indicator that Plutonium-239 (^{239}Pu) or Plutonium-241 (^{241}Pu) may be present.

J L Anderson
RCG-0002-97
July 3, 1997
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Summary

In summary, these analyses provides an indication that no Tier 2 levels were exceeded and that no Department of Energy (DOE) radioactive materials were detected in these samples. The measured levels of naturally occurring radionuclides were within the levels typically observed in the Front Range area.

We are pleased to provide this support. If you have any questions concerning this report, please contact me at Extension 8349 or Digital Pager 3521.

Attachments
As stated

cc
K E Kirchner

ALARA REVIEW NARRATIVE

TITLE SOURCE REMOVAL AT THE MOUND SITE (IHSS 113). AMENDMENT #1

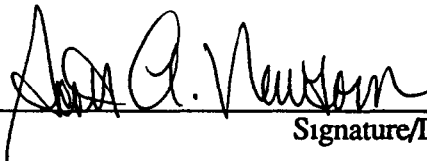
Log No 97-SITE-002

RWP No. N/A

- I. **Task Description** This ALARA Job Review is an amendment that was written to cover the current radiological conditions for the Source Removal at the Mound Site (IHSS 113).
- II. **Radiological Concerns** There are no radiological concerns to be addressed during the Thermal Desorption Unit treatment operations, return of IHSS 113 soils to the excavation site, and the reclamation of the stockpile, treatment, and excavation areas.
- III. **Amended Controls to be Implemented for the Source Removal at IHSS 113**
- 1 1 During the Thermal Desorption Unit treatment operations, return of IHSS 113 soils to the excavation site, and reclamation of the stockpile, treatment, and excavation areas, continuous radiological low volume air sampling and shiftly high volume air sampling will not be required to be performed outside the CRZ boundary. Substantial analytical data has been acquired that indicates that no radiological airborne hazard exists.
 - 1 2 Engineering controls, such as containments, are not required for this project. Supplied air or Self Contained Breathing Apparatus (SCBA) respirators will be required as per the Health and Safety Plan for Industrial Hygiene concerns with the chemicals. There is no radiological requirement for respiratory protection.
 - 1 3 The document entitled "Technical Basis for Posting and Radiological Control Requirements in Environmental Restoration Activities", dated March 5, 1997, shall be used for determining the posting and deposting requirements. The IHSS 113 excavated soils are significantly below the Rocky Flats Cleanup Agreement (RFCA) Tier II soil action levels (see attached memorandum from R. Gentry). Therefore, per the recent change to Article 222 of the Site Radiological Control Manual, there are no radiological posting requirements during Thermal Desorption Unit activities and for the return of IHSS 113 soils to the excavation site.
 - 1 4 Individuals supporting the Thermal Desorption Unit treatment activities, the return of IHSS 113 soils to the excavation site, and reclamation of the stockpile, treatment, and excavation areas are required to wear personnel protective equipment (PPE) per the project specific Health and Safety Plan. PPE used will be radiologically surveyed for unrestricted release in accordance with HSP 18.10 to satisfy waste acceptance criteria for release to the Sanitary Landfill. Equipment that is utilized for treatment / soil handling activities, regardless of destination, shall be radiologically surveyed in accordance with ROI 3.01 and ROI 3.02 for unrestricted release per HSP 18.10. Hand carried items will be radiologically frisked for release. Tools that come in contact with soils shall be surveyed in accordance with ROI 3.01 and ROI 3.02.

- 1 5 Radiological Worker II training will not be required for the Thermal Desorption Unit treatment activities, the return to the excavation site of IHSS 113 soils, and for the reclamation of the stockpile, treatment, and excavation areas
- 1 6 Full-time Health and Safety coverage will be required Pre-job contamination surveys will be performed on treatment / soil handling equipment prior to work activities All equipment that is destined for on site release and that requires radiological surveys in accordance with ROI 3 01 and ROI 3 02, shall require a Property Release Log entry. All equipment that is destined for off site release and that requires radiological surveys in accordance with ROI 3 01 and ROI 3 02, shall require a Property Release Evaluation in accordance with REP 1003 Radiological Operations supervision and Radiological Engineering will evaluate the frequency for performing contamination surveys for the project

Radiological Engineer.



Signature/Date

07/15/97

Radiological Engineering Projects & Programs (REPP) Comments:

- None -

REPP Approval



Signature/Date

7/15/97